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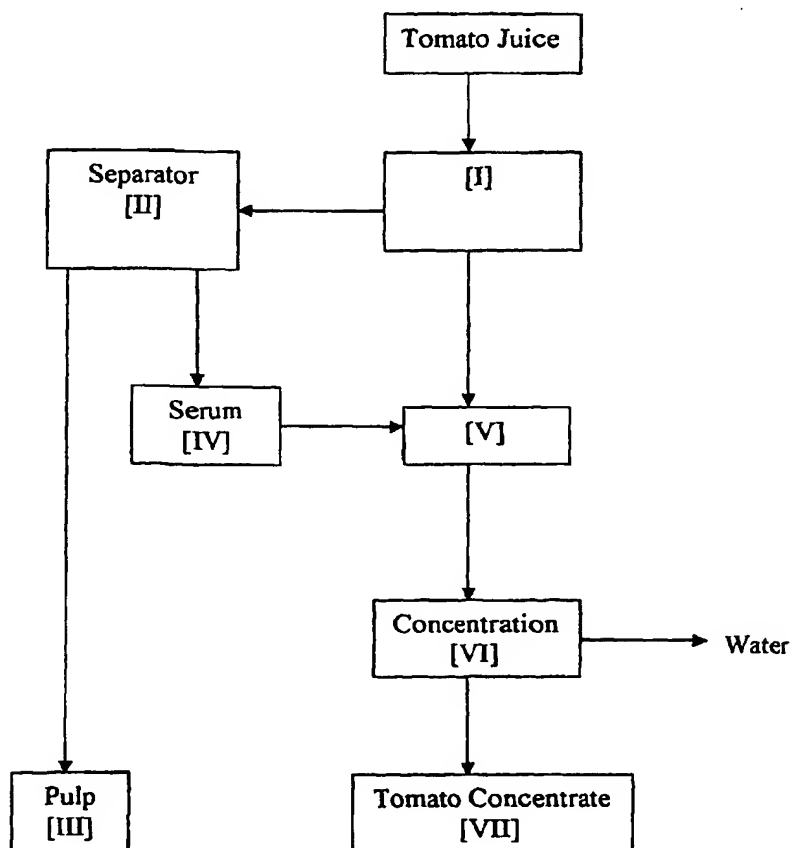
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LK, LR, LS, LT, LU, LV, MA, MD, MG, MK, MN, MW,
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[Continued on next page]

(54) Title: **INDUSTRIAL TOMATO PROCESS AND PRODUCT OBTAINED THEREOF**



(57) Abstract: The invention relates to a tomato pulp composition wherein the particle size is not greater than 2.5 which does not contain seeds or peels from the tomato and has a lycopene concentration which is 5 to 15 folds higher than the lycopene concentration in the tomatoes from which said pulp is obtained. The invention further provides an industrial process for obtaining tomato pulp and tomato concentrate from tomato juice. The invention further provides a method for controlling the viscosity and lycopene concentration of tomato products, tomato concentrate or modified tomato juice, by separating a part of the pulp from the tomato juice from which said tomato products are obtained.

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Declarations under Rule 4.17:

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MG, MK, MN, MW, MX, MZ, NI, NO, NZ, OM, PG, PH, PL, PT, RO, RU, SC, SD, SE, SG, SK, SL, SY, TJ, TM, TN, TR, TT, TZ, UA, UG, UZ, VC, VN, YU, ZA, ZM, ZW, ARIPO patent (GH, GM, KE, LS, MW, MZ, SD, SL, SZ, TZ, UG, ZM, ZW), Eurasian patent (AM, AZ, BY, KG, KZ, MD, RU, TJ, TM), European patent (AT, BE, BG, CH, CY, CZ, DE, DK, EE, ES, FI, FR, GB, GR, HU, IE, IT, LU, MC, NL, PT, RO, SE, SI, SK, TR), OAPI patent (BF, BJ, CF, CG, CI, CM, GA, GN, GQ, GW, ML, MR, NE, SN, TD, TG)

- as to applicant's entitlement to apply for and be granted a patent (Rule 4.17(ii)) for the following designations AE, AG, AL, AM, AT, AU, AZ, BA, BB, BG, BR, BY, BZ, CA, CH, CN, CO, CR, CU, CZ, DE, DK, DM, DZ, EC, EE, ES, FI, GB, GD, GE, GH, GM, HR, HU, ID, IL, IN, IS, JP, KE, KG, KP, KR, KZ, LC, LK, LR, LS, LT, LU, LV, MA, MD, MG, MK, MN, MW, MX, MZ, NI, NO, NZ, OM, PG, PH, PL, PT, RO, RU, SC, SD, SE, SG, SK, SL, SY, TJ, TM, TN, TR, TT, TZ, UA, UG, UZ, VC, VN, YU, ZA, ZM, ZW, ARIPO patent (GH, GM, KE, LS, MW, MZ, SD, SL, SZ, TZ, UG, ZM, ZW), Eurasian patent (AM, AZ, BY, KG, KZ, MD, RU, TJ, TM), European patent (AT, BE, BG, CH, CY, CZ, DE, DK, EE, ES, FI, FR, GB, GR, HU, IE, IT, LU, MC, NL, PT, RO, SE, SI, SK, TR), OAPI patent (BF, BJ, CF, CG, CI, CM, GA, GN, GQ, GW, ML, MR, NE, SN, TD, TG)
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INTERNATIONAL SEARCH REPORT

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A. CLASSIFICATION OF SUBJECT MATTER

IPC 7 A23L1/212 A23L1/275 A23L1/308

According to International Patent Classification (IPC) or to both national classification and IPC

B. FIELDS SEARCHED

Minimum documentation searched (classification system followed by classification symbols)

IPC 7 A23L

Documentation searched other than minimum documentation to the extent that such documents are included in the fields searched

Electronic data base consulted during the international search (name of data base and, where practical, search terms used)

EPO-Internal, WPI Data, PAJ, FSTA

C. DOCUMENTS CONSIDERED TO BE RELEVANT

Category *	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
X	US 5 837 311 A (RAVEH YIGAL ET AL) 17 November 1998 (1998-11-17) cited in the application figures 1,2,6 column 3, line 25 - line 56	5-16
X	EP 0 608 027 A (MAKHTESHIM CHEM WORKS LTD) 27 July 1994 (1994-07-27) cited in the application the whole document	5,10-16
X	US 4 670 281 A (BRADLEY DONALD B) 2 June 1987 (1987-06-02) column 4, line 32 - line 62	5,7
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☒ Further documents are listed in the continuation of box C.☒ Patent family members are listed in annex.

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INTERNATIONAL SEARCH REPORT

International Application No
PCT/IL 03/00678

C.(Continuation) DOCUMENTS CONSIDERED TO BE RELEVANT

Category *	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
A	WO 02 21935 A (ZELKHA MORRIS ; HARTAL DOV. (IL); SEDLOV TANYA (IL); LYCORED NATURAL PR) 21 March 2002 (2002-03-21) page 3, line 29 - page 5, line 30 -----	10-12
A	SULC D: "VERGLEICHENDE UNTERSUCHUNGEN AN TOMATENKONZENTRATEN, HERGESTELLT NACH DEM KLASSISCHEN UND NACH DEM MODIFIZIERTEN SERUM-VERFAHREN" FLUSSIGES OBST, FLUESSIGES OBST, SCHOENBORN, DE, vol. 43, no. 9, 1976, pages 334-338, 340, 34, XP008021486 ISSN: 0015-4539 page 335; figure 1 -----	1
A	TANGLERTPAIBUL T ET AL: "FLOW PROPERTIES OF TOMATO CONCENTRATES: EFFECT OF SERUM VISCOSITY AND PULP CONTENT" JOURNAL OF FOOD SCIENCE, INSTITUTE OF FOOD TECHNOLOGISTS. CHICAGO, US, vol. 52, no. 2, 1 March 1987 (1987-03-01), pages 318-321, XP002043494 ISSN: 0022-1147 cited in the application the whole document -----	5

INTERNATIONAL SEARCH REPORT

Information on patent family members

International Application No

PCT/IL 03/00678

Patent document cited in search report		Publication date	Patent family member(s)	Publication date
US 5837311	A	17-11-1998	IL 107999 A	08-02-1998
			AU 690201 B2	23-04-1998
			AU 1513195 A	03-07-1995
			WO 9516363 A1	22-06-1995
EP 0608027	A	27-07-1994	IL 104473 A	31-10-1996
			AT 217492 T	15-06-2002
			DE 69430601 D1	20-06-2002
			DE 69430601 T2	30-01-2003
			DK 608027 T3	09-09-2002
			EP 0608027 A2	27-07-1994
			ES 2176219 T3	01-12-2002
			JP 7308168 A	28-11-1995
			PT 608027 T	30-09-2002
US 4670281	A	02-06-1987	IT 1185063 B	04-11-1987
WO 0221935	A	21-03-2002	AU 9219801 A	26-03-2002
			EP 1317189 A2	11-06-2003
			WO 0221935 A2	21-03-2002